"WRITTEN SO YOU CAN UNDERSTAND IT."

POPULAR MECHANICS

An Illustrated Weekly Review of the Mechanical Press of the World

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CANAL THAT REVERSED A RIVER'S FLOW

The Engineering Feat of the Century

Canal as Seen at Willow Springs--Looking West

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A Waterphone.
Where the Tan Shoes Have Gone.
Electric Tide Indicator.
Photographing by Moonlight.
A Trackless Trolley Car.
Fifty-four articles—27 illustrations.

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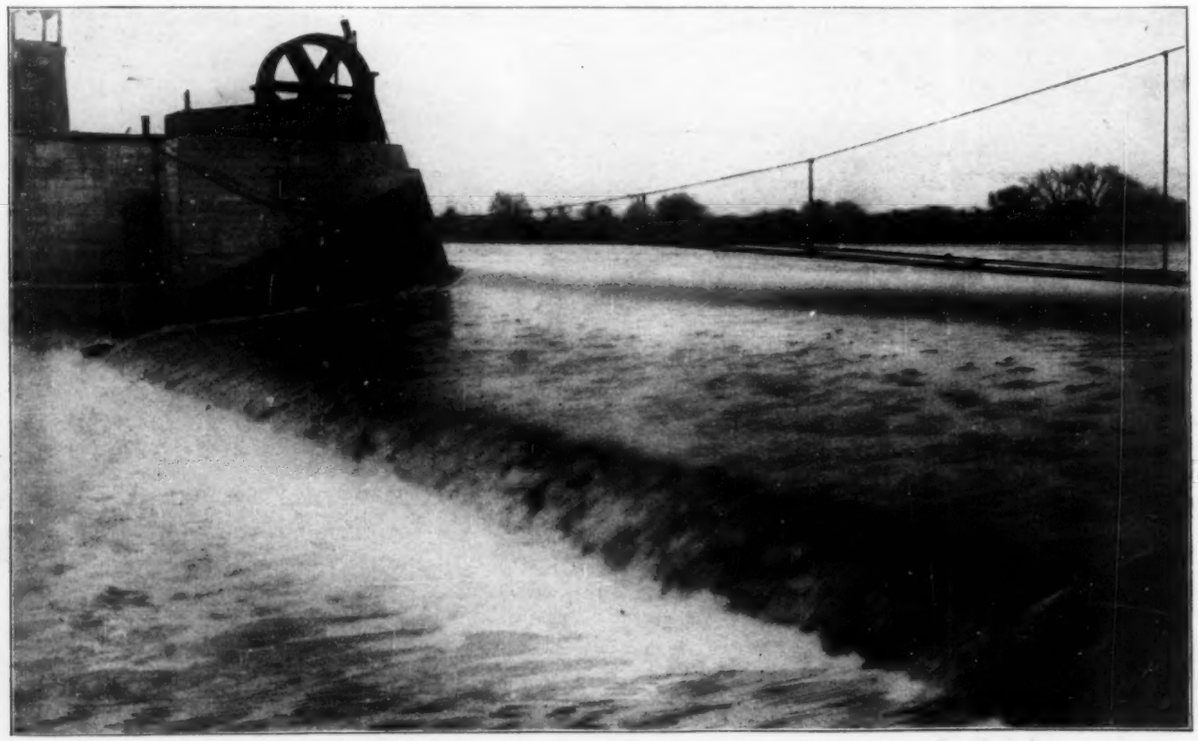
THE WORLD'S GREATEST ARTIFICIAL CANAL

An $82,000,000 Enterprise of Chicago--The Flow of a River Reversed--Government Takes a Hand

The appropriation of $200,000 for the survey of the proposed deep water way from Lake Michigan to the Mississippi rivers, agreed upon by the river and harbor committee of the House, marks the first official step taken by the government in this important project. The Sanitary and Ship canal of Chicago is probably the most remarkable artificial waterway ever built in the history of the world. Its total length, including the improved portion of the Chicago river, is 34 miles. It has the greatest width of any canal on earth, having a cross section of 202 feet at the bottom, as shown in the accompanying illustration, and 306 feet at the top. The ultimate object is to afford a water way for the largest ocean-going vessels from Lake Michigan to the Gulf of Mexico.



BEAR TRAP—MOST REMARKABLE DAM IN THE WORLD.

The work is yet being carried on unceasingly, the widening of the Chicago river being now in progress. Residents of Chicago have already spent $37,378,840 in the construction of the canal. They must spend nearly $10,000,000 more before their part of the work is done. Then it will cost $25,000,000 additional to complete the work necessary to the proposed shipway. This latter expense, however, it is expected, will be borne by the Federal government and the entire canal will become government property.

Thus the total cost when the work at present contemplated is finished will have amounted to more than $82,000,000. The Panama canal is offered to the United States for $40,000,000, or less than half the total cost of the Sanitary and Ship canal. Had this canal been built under conditions that prevail in Central America its cost would probably have been doubled. The expense is said to have been the minimum for the amount of work accomplished. Former Senator Warner Miller of New York said:

"The use of the improved excavating machinery on the Isthmian canal would reduce the cost of construction from 30 to 40 per cent."

The machinery, remarkable for handiness and speed, constructed especially for this work, was a source of wonderment to the mechanical world. Nearly every piece of important machinery used in the entire work was invented for the especial purpose, as nothing in the market could be found answering the requiremets for convenience and speed. The mammoth conveying machine, designed by Hoover & Mason, was essentially a bridge spanning the channel with cantilever arms projecting far out on each side to overhang the spoil area. On this structure were mounted the necessary sprocket wheels and other machinery for carrying a series of steel plans which form the conveyor belt. The structure was 640 feet from end to end, mounted on trucks traveling upon tracks parallel with the channel, and its capacity was 500 cubic yards per hour.

The building of the canal resulted in reversing the flow of the Chicago river, a feat long regarded as an impossibility. The river which formerly emptied into the lake is now an outlet of the lake and empties at its other end into the canal proper. Even yet Chicago is debating as to which is up and which is down the river, which is its head and which its mouth.

The waters flowing through the canal are emptied into the Desplaines river at Lockport, through the controlling works, which comprise several sluice-gates of metal with masonry bulkheads and a bear-trap dam. This dam is regarded by the canal trustees as "the greatest triumph of engineering genius that has ever been achieved in this or any other country."

The sluice-gates have a vertical play of 20 feet and openings of 30 feet each. The bear trap dam has an opening of 160 feet and an oscillation of 17 feet vertically. The controlling works are operated by admitting water through conduits controlled by a valve.

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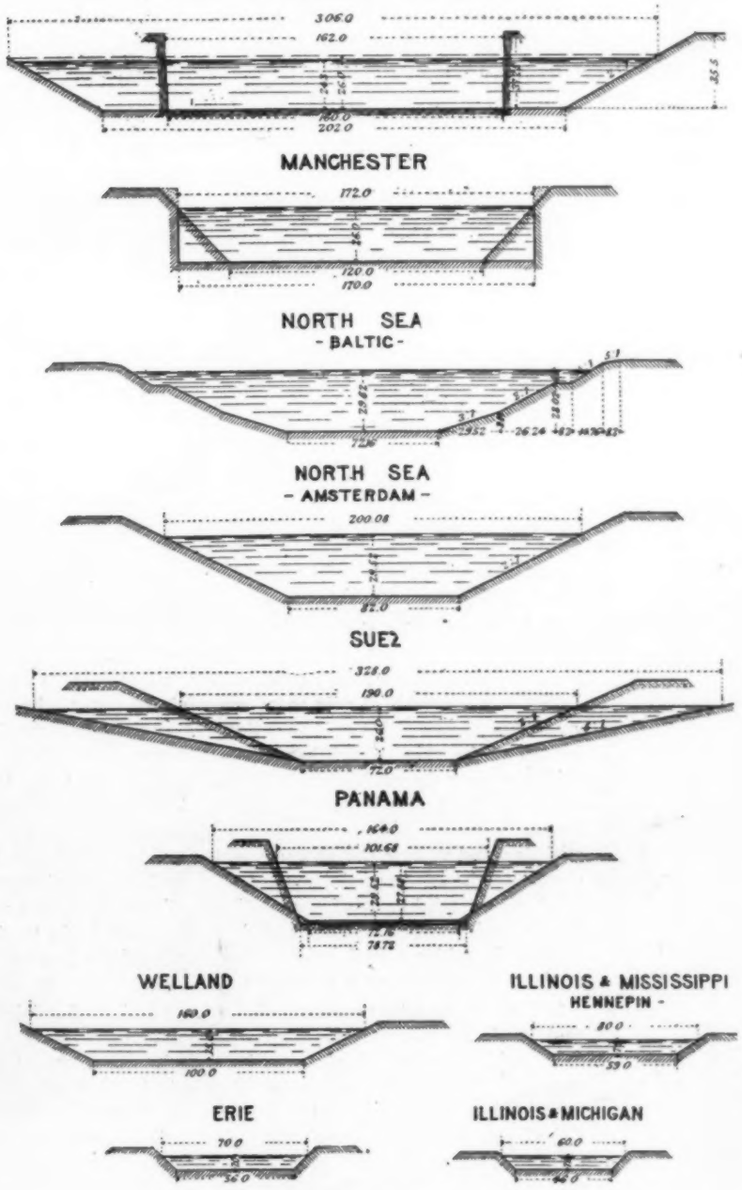
CHICAGO SANITARY AND SHIP CANAL.



CROSS-SECTIONS OF NOTED CHANNELS.

PICKLED PONY MEAT IN OREGON.

Chicago is not the only place accused of being engaged in the horse meat traffic. There is said to be a horse packing establishment at Linnton, Ore., devoted to the pickling of Cayuse ponies, which are abundant in that locality and cheap. The average pony taken to the Linnton abattoir yields only about 60 pounds of merchantable meat, the rest of the carcass going into fertilizer, glue, leather, etc. The meat is carefully pickled and pressed and is shipped to market in France and Holland, where the prejudice against horse meat is not so strong as in this country.

The fish product of the great lakes last year was the largest on record, amounting to 113,728,000 pounds of fish, worth $2,611,400. There were 9,670 persons employed in the fisheries and $6,517,000 invested.

Englishmen have decided that American coal is inferior to the European product, tests having proven to their satisfaction that samples from the United States produced too great amount of ashes.

Paul Harper, son of William R. Harper, president of the University of Chicago, to raise money for charity secured a bootblack's outfit and began shining the shoes of the older students.

RAILROAD TELEPHONES A SUCCESS.

Message Sent 400 Miles over Telegraph Wires as a Test.

The railroad telephone invented by B. J. Tillman has proved a success. A train crew 400 miles from Chicago talked over telegraph wires recently to the chief operator of the Illinois Central Railroad in Chicago. The train was stopped near Fulton, Ky., and the Tillman telephone was connected with the regular telegraph wire running to Chicago. In spite of the fact that the message had to travel over iron wires, which ran parallel to more than a score of other wires, every word was distinctly heard by the chief operator. That it makes no difference whether or not telegraphic messages are being flashed over the wires simultaneously with the telephone messages was proved by the successful transmission of a telegraphic communication from Fulton at the same time the chief operator was conversing with the crew.

TELLS THE TIME BY HIS BELT.

There is a man in Wisconsin who can tell the time of day with unerring accuracy by his belt. A buyer for a Chicago ice company who discovered him, says:

I've heard of many strange time pieces, but this was the limit. I went to a lake in Wisconsin to estimate the ice crop. Among the men working there was a heavyset fellow who was dressed in blanket clothes. He wore a narrow leather belt and several times I noticed him tighten it, one hole at a time. "What time is it?" I asked for my watch was not running. He glanced at his belt and answered promptly "11:30." I asked him how he could tell, and he explained his system. After breakfast, which was at 6 o'clock, the belt was set at the last hole. He knew it was 11:30 because he had taken in five holes and the belt was beginning to slacken. After dinner he would let the belt out again to the last hole and it would mark off the hours again during the afternoon. He said that it was as trustworthy as the best watch he had ever owned and several tests proved that he was right.

FINE FOSSILS FOUND.

Information comes from Cairo, Egypt, of interesting scientific discoveries in the Fayum made by the Egyptian Geological expedition. Remains of large vertebrate animals of the lower miocene were found, which indicate the early forms of rhinoceros and elephants. A representative of the geological department of the British Museum has gone to examine the remains.

What pies prance around the water?—Harpies.

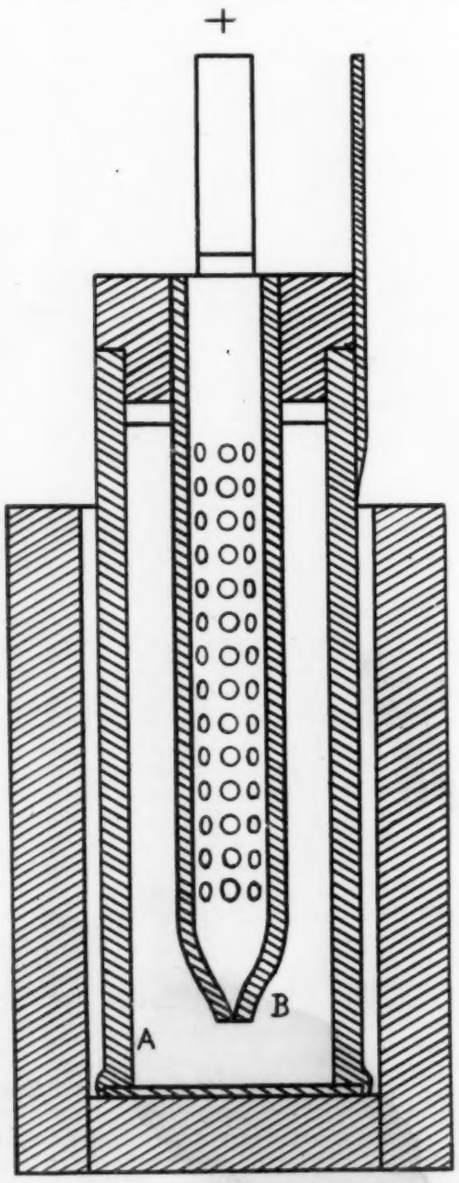
Easy Electrical Experiments

FOR BOYS.

CHAPTER XI.—HOW TO MAKE A STORAGE BATTERY.

By L. P. Dickinson.

A storage cell consists of a positive plate and a negative plate, both made of lead, and dipping into a dilute solution of sulphuric acid. For large cells there are always a large number of positive and negative plates, all the positives being connected to one common terminal and all the negative plates to the other terminal. The storage cell described below is one that is suitable for the amateur's use, and is of the proper size to be readily charged by a few gravity cells.



Procure a piece of lead pipe 1¼ inches in external diameter, and 5 inches long. Having squared off both ends, solder to one end a circular piece of sheet lead so as to form a lead cup of the size just mentioned. This cup is to hold a solution of sulphuric acid, and must, therefore, be free from all leaks. Procure another piece of lead pipe, of the same length as before but ¾ inches in external diameter. With a ⅛ inch drill, bore this as full of holes as is possible, except for a distance of one inch from each end. Hammer the lower end of this tube together as shown at B in the figure. It need not be water tight at this point, but only sufficiently tight to hold a paste which will be described later.

The tube B is to form the positive plate of one cell. The negative plate is the lead cup first mentioned. To support the positive plate so that it will not touch the negative, make a wooden cover for the cell of the same external diameter as the outer tube and ⅞ inch thick. Cut away its lower portion, so that it will fit snugly into the outer tube. Through its center bore a hole ¾ inches in diameter, so that the smaller lead tube will just fit into it snugly. Solder to the upper end of this tube two lead strips, one of which is one inch long, the other three inches long. If these are bent over at right angles and screwed to the top of the wooden block after the smaller tube is in place, then the latter will be held firmly in the block. Now immerse the wooden block after the smaller tube is in place, in smoking hot paraffine wax, leaving it there until the wood has become thoroughly saturated with the hot wax. This is to protect the wood from the action of the acid. Do not get any wax on the lower part of the lead tube.

Make a paste for the positive plate as follows. In an old tumbler make a weak solution of sulphuric acid, by pouring the latter slowly into a half tumblerful of water. There should be about a spoonful of acid to 20 spoonfuls of water. Be very careful in handling this acid as it destroys everything it touches, including the skin of the hands. Never pour water into the acid, but pour the acid into the water slowly as directed. Procure at a paint shop a pound of red lead, and mix a sufficient amount with the half tumblerful of diluted acid to form a very stiff dry paste. Stir the mixture with a stick. Then ram the paste into the inside of the smaller tube until the later is nearly filled with a solid mass of paste. Scrap off any paste that may have oozed through the holes and set the tube aside to dry. Meanwhile solder a lead strip to the outside of the large tube, at the top, to serve as a connector.

Fill the large tube two-thirds full of a solution of sulphuric acid, made by pouring acid into water, until there is 1-12 as much acid as water. A glass graduate such as amateur photographers often use for measuring chemicals is of great assistance in this case. Then insert the wooden stopped with its attached tube into the larger tube. Our cell is now complete, except that a wooden box ought to be made in which to set the cell, to prevent its being overturned. This box can be made square in shape with inside dimensions a little larger than the cell. The latter may be set into the box, and held firmly there by filling all waste space with sawdust.

To charge this storage cell three "gravity" or "crow-foot" batteries will be required. These had better be purchased at an electrical supply store, and it is probable that most amateurs have them already. Join them in series, that is, join the zinc of one cell to the copper of the next, and so on. To charge the cell, connect the terminal marked positive in the figure to the copper pole of the three gravity batteries, and connect the negative terminal of the storage cell to the zinc pole of the battery.

The first time this storage cell is charged, the connections should be left undisturbed as above for one week. At the end of this time it will be found to have acquired quite a charge. After the first charge, it is not necessary to charge it so much, 10 to 12 hours being sufficient.

There are 2,865,466,000 copies of daily newspapers published in the United States every year; 1,208,190,000 weeklies; and 263,452,000 monthlies, making a grand total of 4,337,108,000. The number of copies of new books published in a year is 10,000,000.

BLUE PRINTING BY ELECTRIC LIGHT.

For years it has been the practice to make blue prints by exposure to sunlight. This was all right in the old days when things moved slowly. Now time is a prime essential, and on a large constructive operation frequently several hundred blue prints must be made. As the workmen can do little until the blue print reaches their hands, the importance of a delay of

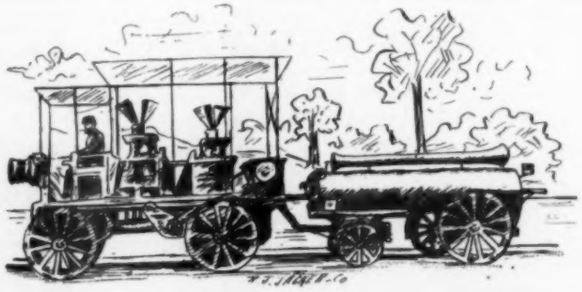
OUTFIT FOR BLUE PRINTING WITH ARC LAMPS.

sometimes several days, waiting for the sun to shine, is readily appreciated.

An important time-saver has been perfected at the works of the General Electric Co. It consists of a metal, porcelain-lined reflector or canopy in which is suspended powerful arc lights, one lamp for each 864 square inches to be illuminated. The reflector is 36 by 48 inches at the bottom, although specially large sizes can be made to order.

AUTOMOBILE FLOUR MILL.

The Austrian army has recently added to its equipment an automobile flour mill, which will not only propel itself from

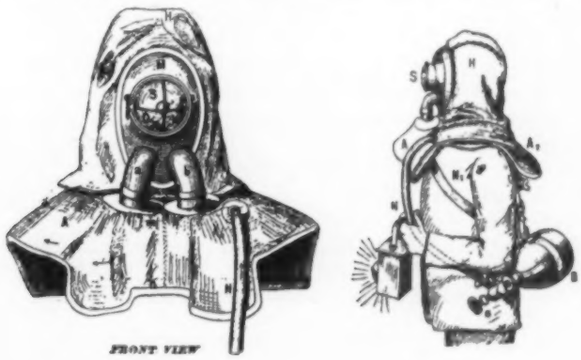


place to place, but grind feed or flour when desired. Our illustration is from the American Miller, which says there can be little advantage in the machine, as an army would find flour mills wherever wheat and grain are raised.

FOR RESCUE WORK IN MINES.

Respiratory Apparatus Used in This Most Perilous Task.

Rescue work in mines where all kinds of deadly gases commingle with the air, is generally attended with much greater danger than is experienced by firemen in entering burning buildings. Hence the men who dare these poisonous breaths, the intense heat and danger of explosions, need the very best protection. A respiratory apparatus and protection helmet used in this hazardous work is herewith illustrated. It has been placed on the market by a firm in Vienna. The helmet is made of rubber for ordinary purposes, and of leather for use in instances where the heat is so great that it would melt the rubber. The mask is held in place by straps passing over the head and around the



FRONT VIEW

FIG. 1.

side of the face. A respiration bag and an oxygen bottle are the two most essential parts of the equipment. The former is in connection with the lower part of the helmet and extends about the neck and shoulders. The front part of the bag (A) extends about six inches below the chin. The wearer of the mask is enabled to see by the aid of a glass disk in front.

Breathing is effected through two small rubber tubes, a and b, shown in Fig. 1. They are fitted with glass valves. The inhaled air is drawn from the left section of the respiration bag through the tube b, and the expired air is discharged into the right section through the tube b. The oxygen bottle B is suspended from a bandolier over the shoulders. It is connected with the air bag by means of a rubber pipe. The bottle is usually of about 90 inches capacity. The flow is regulated by screw valves and a reducing valve.

A WATERPHONE.

This simple but effective instrument detects leaks in water pipes. The inspector places the end of the rod against the pipe

and holds the "phone" to his ear. If there is any flow or drip it will be distinctly heard.

The Illinois Central and other roads will plant catalpa trees to use in making ties. There are two species of the tree. The catalpa speciosa is slow to decay. One tree twelve years old will make one tie; a tree sixteen years old, three ties, and one twenty years old, five ties.

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TERRIBLE "BIZARRE" CRAZE IN PARIS.

Artist Kills His Model to Get Death-Like Tints of Flesh.

The "bizarre" craze in Paris is creating consternation everywhere. Here is a late instance of its horrors:

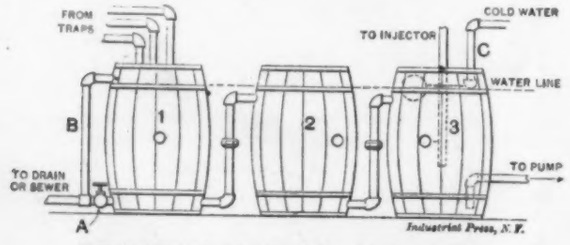
A French artist was putting the finishing touches on his painting, "The Death of Venus," which he meant to be his masterpiece. So that his model would be life-like, or rather death-like, he had been in the habit of hypnotizing her during the three hours she posed each day. That last day he grew dissatisfied with the flesh tints he had imparted to Venus, so he administered a fatal dose of chloroform to the sleeping woman. After she had passed from partial unconsciousness to death, he copied with marvelous accuracy the precise hues of the dead model's flesh. Then he lay on his couch, after swallowing the rest of the chloroform that was left in the little vial, and died.

When a friend of the artist visited the studio that afternoon he read the story of the tragedy in three slips of paper. A lead-penciled epitaph in the girl's hand read: "She died for Art." The inscription above the painter's head was: "He strove for immortality." The paper hanging from the painting bore the words: "Their monument."

APPARATUS FOR REMOVING OIL FROM EXHAUST STEAM.

A simple, home-made device for removing oil from the condensation of exhaust steam is described by a writer in Steam Engineering.

This apparatus is to be used where the returns come through



Simple Apparatus for Purifying Oily Feed-water.

steam traps. Get three whiskey barrels and connect them by 1¼ or 1½-inch pipe, as shown in the sketch. The drips from the traps flow into barrel No. 1. The barrels are open at the top, as no pressure is carried in any of them.

When all the barrels fill to the water line indicated, the oil and scum will be taken off by the overflow pipe B; if enough water does not come from the drips to keep the barrels filled to the water level, the deficiency is supplied from the cold water pipe C. By opening the valve A, barrel No. 1 can be drained out, and also any oil and scum that has worked through into barrel No. 2 will run out through the pipe connection into No. 1. The cold water feed will then wash out barrel No. 1. Of course valves may be put in the bottoms of barrels Nos. 2 and 3 to drain them completely, but I do not consider it necessary.

RADIAL FAN MOTOR.

While the original style of fan motor with its strong, direct breeze is more largely used than ever, the General Electric Company offers a new style known as the radial fan motor, which is designed especially for use on desks and tables, and will be found particularly adapted to public dining and reading rooms, where a strong blast is objectionable.

As shown in the accompanying illustration, the fan is placed in a horizontal position, and it so revolves as to draw air from above and force it against the reflecting surface directly beneath the fan, causing a gentle breeze horizontally in all directions. The fan motor is 24 inches high and has three speeds.

ABOUT PATENTS IN FRANCE.

In France the person who has obtained a patent must work his invention in France within two years after the date of the patent or he will lose his rights. The cost of a French patent is $96.50, five years, and in the same proportion for ten and fifteen years. The tax is paid in annuities of $19.30 in advance.

To obtain a patent, every inventor must file at the prefecture of his department an application to the minister of commerce and industry, in which is mentioned the subject of his invention as well as the desired duration of the patent; a complete description of the invention, in duplicate; drawings or specimens necessary to the understanding of the description, also in duplicate, and a list of the papers thus filed.

HOW WIRELESS TELEGRAPHY WAS DISCOVERED.

Electric Sparks That Flashed Across the Gap of a Broken Hoop Originated the Idea.

It was the discovery of Prof. Heinrich Hertz, a German scientist, that caused Marconi to perfect wireless telegraphy. Prof. Hertz in experimenting accidentally produced electric waves and detected their presence in the ether by means of a wire hoop so broken that the electricity sparkled across the gap, says Herbert Wallace in Success. No one, not even Hertz himself, realized the tremendous importance of this discovery. The professor had detected a spark in a broken hoop a few feet away from the flash of an induction coil. Why didn't he get a better detector than a broken hoop and a bettter transmitter than a small induction coil? Why didn't he or any one of a hundred of the other great scientists of the time think of utilizing the discovery? Thus queried Marconi to himself, who for a year thought the idea would surely come to some one else. He was no electrician himself; he had not completed any college course. It would seem presumptious for him to attempt what the others had not thought worthy of an effort. But as time went on he became impatient. He began to experiment, and wireless telegraphy, the most important discovery since Faraday invented the induction coil, was the result.

HOW DYNAMITE IS MADE.

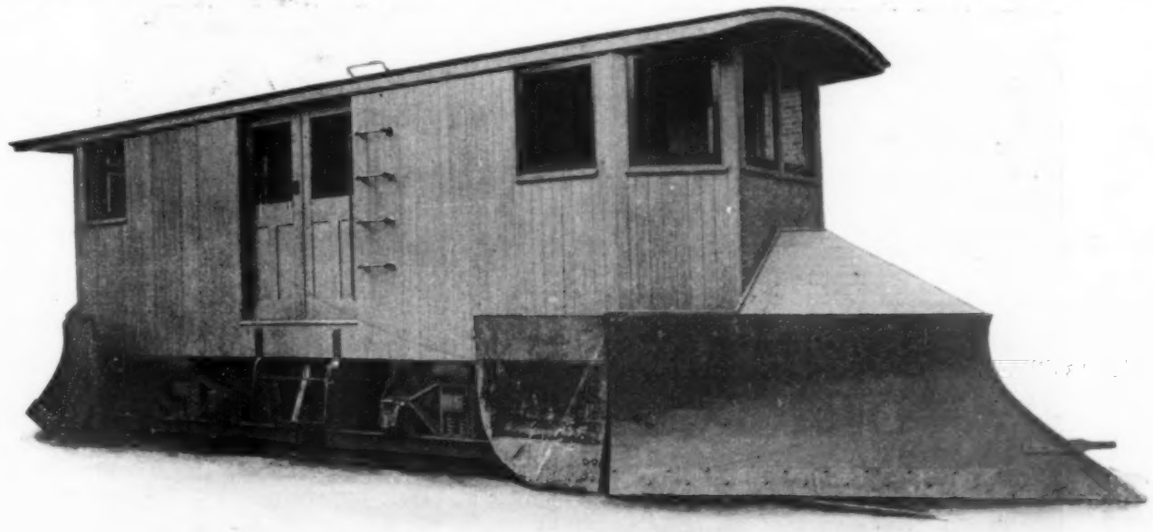
Erroneous Ideas About Its Explosive Powers—Will Burn as Quietly as a Stick of Wood.

By W. B. Lewis, President of the American Forcite Powder Company.

Dynamite is composed of nitro-glycerine and a dry substance called the absorbent. In its manufacture we make first the nitro-glycerine, which is prepared by the action of a mixture of concentrated nitric and sulphuric acids upon glycerine, introduced drop by drop. The nitro-glycerine is introduced into a large tank arrangement which is filled with the absorbent—a form of powder made up of wood meal and nitrate of soda. As a result of this absorbing process dynamite is obtained. The substance very closely resembles brown sugar.

Then the dynamite is made into cartridges or sticks. The cartridges are cylindrical in shape and are generally 8 inches long, 1¼ inches in diameter, and weigh half a pound each. The outer coating of the stick is of heavy waxed paper. In fact, a cartridge is simply a cylinder of this waxed paper tightly packed with dynamite.

It is generally believed that it would be suicide for any one to touch a match to a stick of dynamite. The idea is entirely false. Before dynamite will explode from heat the temperature must rise to 350 degrees. Dynamite will burn like a stick of wood, without the least danger of explosion. I saw a freight house containing 500 pounds of dynamite burn and with it the dynamite, as quietly as so much coal.



ELECTRIC SNOW PLOW.

ELECTRIC SNOW PLOW.

To operate a trolley line out in the country is a very different matter from running a city line. The snow plows which cleared the tracks in town have been found unsuited to country lines. This has brought about the construction of big electric snow plows, one of which, built by the Taunton Locomotive Works, we show herewith. This car weighs about 20 tons, has its own motors of nearly 100-horse-power, and will push through immense drifts, throwing the snow many feet on either side the track. Within the car are levers for starting and stopping the car, raising the big steel "nose," and applying the air brakes. The car is heated and lighted with electricity and an electric headlight placed on top the car lights the track. The trolley pole, which conducts the current for all this work, is not shown, but is of the usual type.

Gas of a very high illuminating power and free from sulphurated hydrogen has been extracted from cork and successfully tested in the opera houses of Paris.

WHERE THE TAN SHOES HAVE GONE.

What has become of all the tan shoes? This was a question asked by many until the recent damp weather of early March, when several wearers of supposedly black leather shoes discovered that their pedal adornment was only out-of-date tan shoes died black. Now it is told in the Shoe Trade Journal that two Chicago dye houses alone have recently changed 18,000 pairs of shoes from tan to black. But the dye won't stand the dampness, and the firms who have thus victimized their patrons have lost a great amount of trade and discovered that their greed to economize has cost them dearly.

Sixty new storm warning towers, equipped with the latest improved lanterns have been installed at ports on the Great Lakes by the United States Weather Bureau.

BREAKS THE WILL OF GEORGE WASHINGTON.

Prince Henry Removes Sacred Sword From Its Scabbard While Americans Look On.

Fear of offending a prince caused Prince Henry's entertainers to violate one of the most sacred precepts in American history—to look on in silence while the will of George Washington was being broken.

From the time of Washington's death the sword presented to him by Frederick the Great remained sheathed in its scabbard until the visit of Prince Henry to America. Following are the words of Washington's will regarding the sword given him by Frederick the Great, which he so highly esteemed:

"It shall not be drawn from its scabbard except in defence of its country."

When the German prince visited Albany, N. Y., on his recent visit, he was allowed to inspect the sacred relic. Of course he knew nothing of the provisions of the will, and no American standing near had courage to inform him when he grasped it by the hilt to draw it from its sheath. Slowly the hallowed steel was removed from its long hiding place. "It gives me pleasure to see and handle it," said the prince, as the bright blade flashed in the daylight, and not a flush of shame came to the face of any American there.

HOW DIFFERENT NATIONS KILL DOGS.

Electrocuted in the Pounds of Great Cities of America—Asphyxiated in London and Paris.

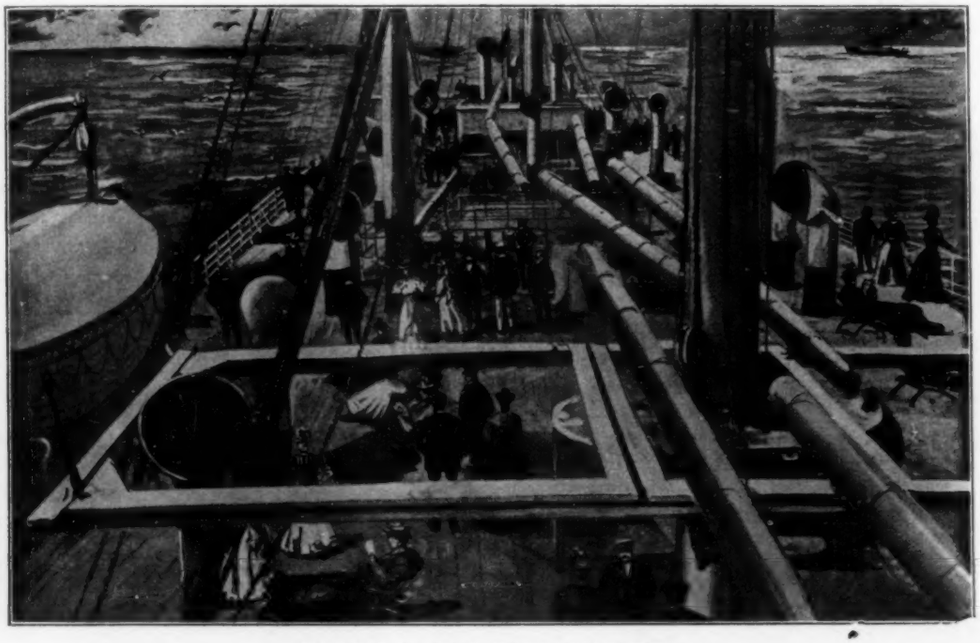
Killing the great number of dogs that fill the dog pounds of large cities is a problem that has been solved in different ways by different countries. In the United States electricity is generally used. It causes instant death, but its great objection is that only one dog can be killed at a time. This is a slow process in pounds containing thousands of the canines.

France seems to have a speedier and equally humane method. It has recently established a "lethal chamber for the destruction of lost dogs." Thirty condemned dogs are placed in a cage, says Consular Clerk Glavis, which cage is rolled onto a platform, which, by hydraulic force, sinks about six feet into the earth and is hermetically closed. Carbonic acid gas is turned on and in the space of forty seconds every dog dies without a struggle. By the old system, the use of common gas, the dogs sometimes suffered for two and three minutes. In London pounds an admixture of carbonic acid gas and chloroform is used, but Paris has decided that the chloroform is useless.

COMFORTS OF OCEAN TRANSPORTATION.

Vessels of Great Speed Are Not the Easiest Travelers.

How to make ocean traffic more agreeable to passengers has been a subject of study among steamship men since the earliest days of civilization. As a result it seems that the modern steamship of to-day offers about every convenience and accommodation that it is possible to provide. It is not the fastest vessel that affords the greatest amount of comfort to the tourist. Vessels that carry enormous cargoes of freight are generally the easiest travelers, though they lack the speed of the exclusively passenger steamers. On such vessels the passenger accommodations are generally located amidships, where the minimum of motion is noticeable. The staterooms, as well as the dining rooms, library and smoking room are all above the main deck and consequently are thoroughly well lighted and perfectly ventilated. On the finest of these vessels, such as are operated by the Atlantic Transport line, no second cabin or steerage passengers are carried, and the passengers have the freedom of the immense decks, which cover the whole of the ship. These vessels make the trip from New York to London in about nine days. Two steamers like the "Minneapolis" are to be added to the Atlantic Transport line this spring.



COMFORTS OF OCEAN TRAVEL—DECK SCENE.

A Haverhill, Mass., shoe manufacturer couldn't find his shoes to wear to a ball. The hour was 7:30 p. m., the need desperate. He hurried to his factory, turned a pair of shoes in twenty minutes and wore them to the ball, arriving just twenty minutes late.

The highest mountain in the United States is Mount McKinley, situated at the headwaters of the Sushitna and Kuskowim rivers in Alaska. It is 20,464 feet high.

POSTOFFICE SELLS PRECANCELLED STAMPS.

Novel Departures From Old Customs in the Chicago Postoffice.

As a result of the enormous quantity of mail handled by the Chicago postoffice many improvements have been inaugurated that are destined to mark an innovation in the methods of handling mail. Pre-cancellation of stamps might be mentioned as one of these. These ready-cancelled stamps are bought in wholesale lots by the big mail order houses to save annoyance and delay at the postoffice. There is a department in the central office where the stamps are cancelled in sheets of a hundred at a time, the sheets being fed to a job press. The year, the month and the words, "Chicago, Ill.," are printed on each stamp. Dealers often buy them 100,000 at a time. They are pasted on the letters or catalogues at the mail order houses and the postoffice is saved the further trouble of cancellation. Should these 100,000 stamps each be pasted on two-pound catalogues before they had been cancelled, it would mean that 100,000 pieces weighing 200,000 pounds would have to be handled in the postoffice one at a time and 100,000 impressions would have to be made with the hand-cancelling machine. This work is often made exceedingly irksome when the stamps are not precancelled. There are all sizes of envelopes, which first have to be gone through and "faced" so that the stamps will all appear on the same side in the stack when the hand-stamping machine is being worked.

Another important departure from the old custom is in the routing of wrappers for catalogues before the catalogues have been inclosed. It used to be that the great mail order houses of Chicago would flood the postoffice with tons of these catalogues, already wrapped when they arrived. They were hauled to the postoffice in sacks, often taking up an acre in space. These sacks had to be untied, emptied, the catalogues handled one at a time by different departments, until they were successfully routed, and then sent on their respective journeys. Now the mail order house first addresses the wrappers, leaving out the catalogues. The wrappers are sent to the postoffice and turned over to the route agents. The space these wrappers occupy is insignificant in comparison to the piles of sacks that had to be handled before the new system went into effect. The wrappers, after being correctly routed, are returned in packages to the mail order houses. There the catalogues are inclosed in them and they are then placed in bags marked "Ohio," or whatever the destination may be. The bags are thus sent directly to the weighing platform and do not have to be returned to the postoffice again.

In this way hundreds of dollars are saved the mail order house in catalogues and stamps. Often the address on the wrapper is wrong, and as the wrappers are not stamped until the catalogue is inclosed the dealer in each instance is saved the loss of a stamp and a catalogue. Four hundred dollars in 15-cent stamps was saved one firm not long ago in sending out a single batch of catalogues representing $15,000 in stamps.

COMFORTS OF OCEAN TRAVEL.—DECK SCENE.

DEEPEST PART OF ATLANTIC OCEAN FOUND.

Depth of Nearly Five and One-Third Miles Discovered North of Porto Rico.

The lowest depth ever found in the Atlantic ocean has been sounded by the United States steamer Dolphin in latitude 19:35 north, longitude 67:43 west, in the depressed area north of Porto Rico discovered by Lieutenant Bronson in 1882. The depth is 4,662 fathoms (27,972 feet). Bronson found 4,561 fathoms (27,366 feet). The deepest part of the ocean yet discovered is in the North Pacific, and was discovered by Lieutenant Commander H. M. Hodges, who measured a depth of 5,269 fathoms (31,614 feet).

The deepest sounding in the Caribbean sea is south of the Great Cayan and is 3,428 fathoms (20,568 feet). The deepest known place in the South Atlantic is a spot of 4,030 fathoms (24,180 feet), eleven miles south of the equator.

POPULAR MECHANICS IS "WRITTEN SO YOU CAN UNDERSTAND IT."

WHY EUROPEANS TOUR AMERICA.

Referring to the great number of scientific men of Europe—investigators, engineers, master mechanics, sociologists, statesmen and business men—who have toured America in the past two years, Frank H. Mason, United States Consul General at Berlin in his report says:

"It has become recognized that a visit to America—a closer, more intelligent knowledge of the social, industrial, and economic conditions which exist there—is now an essential part of a practical European education. Far more clearly than ever before, it is seen by intelligent Europeans that the type of man that has been evolved by more than a century of democratic government, free education, and equal opportunity, emancipated from monarchical and aristocratic influences, is worthy of being carefully studied amid the surroundings which he has himself created."

MENU MADE UP OF PICTURES.

Knowledge of French, or English either, for that matter, was not necessary in ordering from the bill of fare at the annual banquet of the Merchants and Manufacturers' association at Hotel Rennert, Baltimore. Everything on the menu was represented by illustrations. It contained pictures of celery, salted almonds, salted pecans, olives, shell oysters, a bottle of Haut Sauterne; terrapin a la Rennert, a bottle of Piper Heidsieck, roast turkey capon, new peas, mushrooms, Mumm's extra dry, canvas-back duck, creamed hominy, currant jelly, ham, lettuce with French dressing, fancy ices, assorted cakes, almonds, raisins, Cafe Noir, White Rock Lithia and cigars.

TO MUZZLE ROOSTERS.

No more is the cock's shrill clarion to call us from our lowly beds. A Yankee of Brockton, Mass., has invented an appliance which he asserts will keep roosters from crowing in the early morning. The device is fastened to the bill of the bird at night by a simple device which does not interfere with respiration. When the chanticleer rises before the dawn and attempts to sound the reveille, he finds his ambition balked, and not until his owner removes the gag can be give vent to his matutinal rejoicings.

WORE BOOTS IN THE PALACE.

Royal etiquette does not permit the wearing of boots in the palace of the Czar. Probably the one exception to this rule was the late Dr. Zakhrin, physician to the late Czar. He was very unconventional, appearing in a dressing gown and the big black boots of a Russian peasant and when invited by the Czarina to lunch at the Imperial table declined, declaring he never took meals with women. However, the Czar overlooked that and many similar offenses on account of his wonderful skill as a physician.

The postoffice department has decided on a new stamp to be used on registered letters sent abroad. It will be of 13-cent denomination and will bear the likeness of former President Harrison.

IN COLD STORAGE 2,000 YEARS.

Dr. Herz of St. Petersburg, Russia, has discovered in Siberia a huge mammoth in an almost perfect state of preservation, the body having been frozen in the ice for 2,000 years. The animal was covered with a coat of rather thick brown hair. There was grass in its mouth and food in its stomach.

ELECTRIC TIDE INDICATOR.

The movements of vessels leaving port are largely governed by the tide, it being desirable to sail on a high tide when the water is deepest. L. Y. Schermerhorn described to the Engineers' Club of Philadelphia recently the electric device used by the U. S. government to accurately indicate the depth of water.

Tide tables, or the theoretic time of daily high and low water, and the height of the tide, for each day in the year, have been developed by the Coast and Geodetic Survey for all prominent points upon the tidal waters of the United States. The daily time of high and low water bears a fixed relation at each locality to the time at which the moon crosses the meridian of the place for which the tide table is calculated, while the daily relative position of the sun and moon at the time when the moon crosses the meridian determines the theoretic height of the tide. This in-

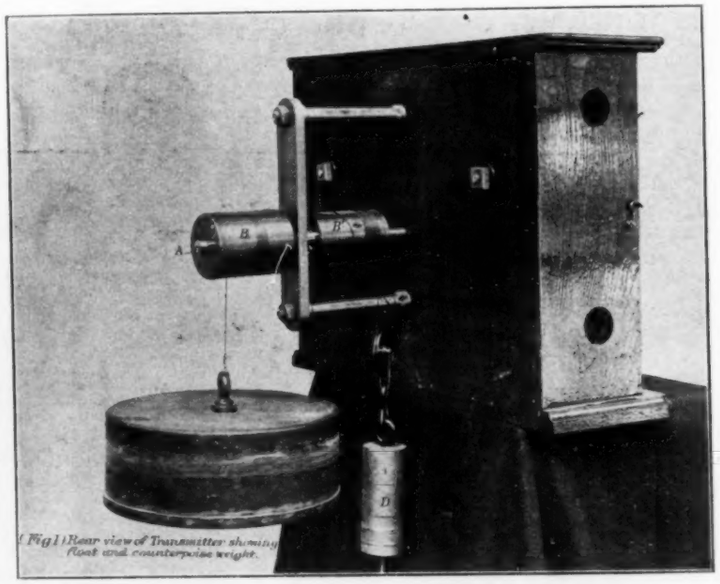
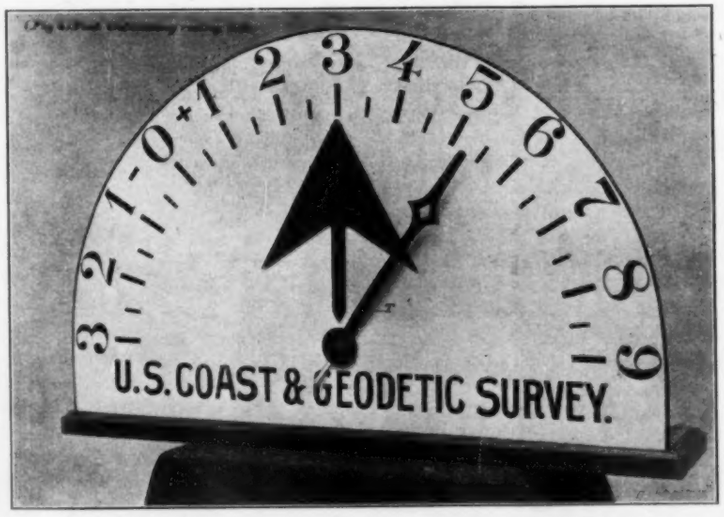
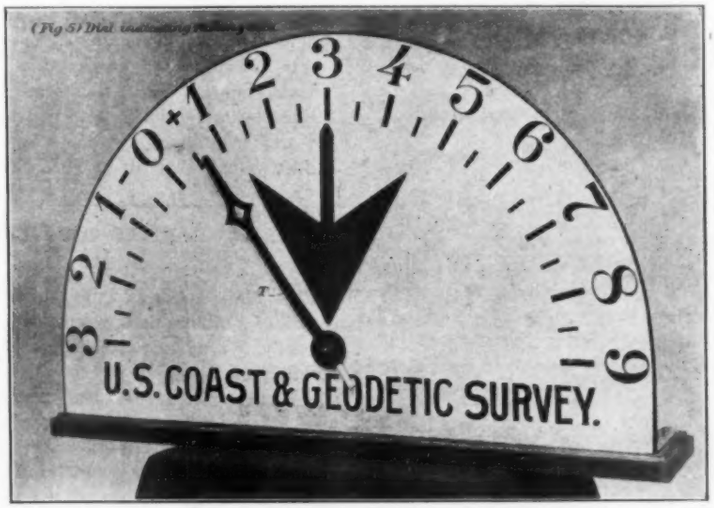


Fig 1 Rear view of Transmitter showing float and counterpoise weight.



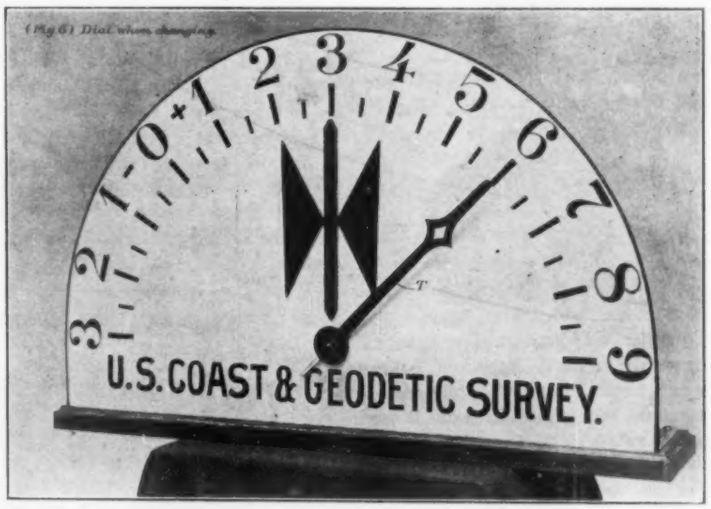
terval, which would be correct but for the effect of wind and freshet, between daily high and low water, and the time at which the moon crosses the meridian, is called the "establishment of the tides." Wind and storms frequently cause a change of several feet in height and two



(Fig 5) Dial indicating Falling

or three hours in time, from the normal figures. Hence the necessity of an accurate knowledge of the height of the tide at all times.

Our illustrations, which are used by courtesy of the Engineers' Club of Philadelphia, show a machine which is in use



(Fig 6) Dial when changing.

in Philadelphia. It was invented by Dr. Hasler, of Berne, Switzerland, and improved here. Fig. 1, shows the float which rises and falls with the water. Fig. 4 shows a rising tide; Fig 6, shows the arm changing from a rising to falling tide, and Fig. 5, a falling tide. The range is from 3 feet below ordinary low water to 9 feet above, giving a range of 12 feet rise and fall. The indicators are in the government offices half a mile from the water, and connected with the transmitter by an electric wire.

AN INCLOSED BRIDGE UNDER WATER.

"Submarine bridge" would be a better name than "tunnel", for the mechanism via which the Pennsylvania and Long Island Railway proposes to covey its trains under the North and East rivers into and out of New York City. The bed of the rivers is a soft, oozy mass of mud nearly 100 feet deep. The road proposes to build a bridge beneath the river bed. It will be supported on piers extending through the mud and resting on solid rock. To keep away the water and mud, this bridge is to be inclosed in a long, big steel tube. This tube is what is generally termed the tunnel. The piers and bridgework and not the tube will bear the weight of the train. These bridge tunnels will cost $50,000,000 and it will take three years to build them. The trains are to be operated by electricity.

The first boat to reach Chicago from the east shore of Lake Michigan this spring, was the Edward Buckley, which arrived a few days ago from Manistee with 1,000 tons of salt.

THE PROBABLE CAUSE OF METEORS.

Are meteors particles of the earth thrown so far into space by volcanic eruptions when the earth was young that they are just now returning? Such is the theory advanced by some scientists. They claim that in the past the earth was so hot as to be beyond the possibility of maintaining a surface. It was a molten mass with gases back of that—in fact, a nebula. It extended far out beyond its present limits; it touched the great central nebula, the sun; it was part of it, the same chemical elements composing both. Sir Robert Ball, the famous astronomer says:

"Probably the force of the explosion in that far-off age projected particles into space with a velocity so great that gravity was overcome, so far as the earth was concerned, and these particles, caught by the sun and turned into closed orbits, became members of our solar system, crossing the earth's orbit every few years.

"At those times the earth was elsewhere in its course, but each little earthborn wanderer, faithful to the laws that govern it, repaired again and again, perhaps a million times, to the place whence it first took flight, until at last, meeting the earth just there, our eyes see it consumed in one bright flash, and we say 'meteor.'"

THE DEADLY TANGEN TREE.

One of the most deadly trees in the world is to be found in Madagascar. It is known as the Tangen tree. By the natives it is regarded with horror. For centuries it was the custom to use the fruit of the Tangen for the purpose of ascertaining whether criminals charged with grave offenses were guilty. The judge on handing him the fruit to eat told him that if it did not harm he would be considered innocent, but if it killed him he was guilty. Very few were ever found to be innocent according to this test.

UNCLE SAM GETTING CANADA'S TRADE.

Despite tariff restrictions trade between the United States and Canada showed a substantial increase last year while that between Canada and Great Britain decreased heavily.

Imports from Britain under the preferential tariff declined from $44,279,933 in the year previous to $42,819,995 last year; while imports from the United States, under the tariff revision of the present Dominion Government have increased from $102,080,177 to $107,149,325 between the two years mentioned.

The total aggregate trade of the Dominion for 1895 was $224,420,485, as against $386,903,157 for the last year, an increase of about 72½ per cent in the six years.

THE FOSTER FOG SIGNAL.

Fogs are a great source of anxiety and danger to mariners. Even when the signals from one vessel are heard on another, it is often impossible to tell the location, and still more difficult to determine the direction in which the ship is moving. The Foster signal is designed to tell the whole story. The machine has eight fog horns, or one which revolves and utters

the blast at each of eight points of the compass. By reading the signals definite information is gained.

The full code is as follows: One long blast, the signal you hear is north of you; one short blast, it is south of you. Two long blasts, signal is northeast; two short blasts, it is southwest. On long and one short, it is east; one short and one long, it is west. One long and two short, it is southwest; two short and one long, it is northwest.

GREATEST INDIVIDUAL EXHIBITION IN HISTORY.

The Krupp cannon foundry is preparing the greatest individual exhibit in the history of expositions for the Westphalian arts exhibition, which opens at Dusseldorf in May. It will be the first display arranged by the great cannon builder since the Chicago World's Fair. The cost will be more than $1,190,000. The exhibition will be replete with types of monstrous war weapons. At one end of the pavilion will be the prow of a German battleship, bristling with guns.

WILL SAVE BURNED THUMBS.

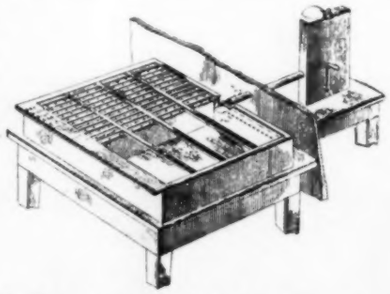
Popping corn is usually remembered for several days following by deep blisters near the end of the right thumb. A Cincinnati

man has taken out a patent to prevent further trouble. A rod extends from the wire basket to the end of the handle, and by drawing the rod the lid of the popper is raised.

The largest sum ever spent in improving one street was $14,800,000, on the Rue de Rivoli, Paris. New Cannon street, London, cost $14,750,000.

VOTING MACHINE.

The accompanying cut shows neither a chicken incubator nor a sorgum pan. It is a voting machine invented by a Cali-



fornian. A bank of push buttons are arranged, one for each name, and the voter pushes the button and the machine does the voting by recording in a tape. The usual safeguards against voting more than once for the same name are provided.

TELEPHONE OPERATORS SET IN GLASGOW.

In the Glasgow corporation telephone exchange at Glasgow, Scotland, the main switchboard is what is known as a table

board, with an overhead canopy carrying the plugs and jacks, as opposed to the more common vertical boards. The operator's telephone sets, unlike the American practice, have breast-plate transmitters, while the headgear receivers are similar to those used in this country, says the Western Electrician.

To make the receivers and transmitters as light as possible, they are constructed of aluminum. The accompanying illustration shows the arrangement of one of the operator's sets. The instruments were made in Christiana, Sweden.

The collection of lake trout eggs in Lakes Superior and Michigan by the Commission of Fisheries last year aggregated 224,000,000 eggs, from which 19,000,000 fry were hatched.

TABLOID RESTAURANT FOR CHICAGO.

A "tabloid" restaurant is promised for Chicago, "Here", says the Hotel World, "food will be given in tablets resembling carmels and a meal can be carried in the vest pocket. The promoter says that mankind needs nutriment in homeopathic doses, not great bulk that has little nourishment. There will be no great trays of dishes under which struggle muscular waiters. The tabloid can be shot through tubes to the dining table and no one will be visible but the guest, who swallows a dose and suddenly finds that hunger has departed.

WHERE SPONGES COME FROM.

The United States buys abroad more than half a million dollars worth of sponges annually. The principal shipments come from Nassau, Bahama Islands. London and Piraeus also furnish the United States with a large quantity of sponges, says the Coast Seamen's Journal. The highest grades of sponges are found in the waters of the Levant, the very best of which are gathered about Syria. Greek and Turkish sponges have been known to the trade of the world for hundreds of years. Several methods are employed in collecting sponges. In comparatively shallow water they are hooked up with a harpoon. At depths of from 180 to 240 feet they are dived for. At depths of from 300 to 600 feet they are dredged for with nets. The primitive method of diving is most popular in the Levant. The diving is done with no other apparatus than a slab or stone to serve as a sinker and a cord to communicate with the surface. The diver on reaching the bottom hastily snatches up as many sponges as possible throws them into a net and then tugs violently at the cord and is drawn to the surface.

NEW DEVICE FOR TAKING SOUNDINGS.

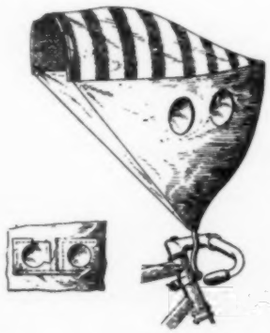
A new device for taking soundings will be used in determining the route of the projected Pacific cable. It consists of a large iron cylinder, topped by a cone and containing air. It is hermetically sealed, except when the cylinder is immersed. Then water flowing into the cylinder and through a tube has access to the cone containing the air. Working on the principle of hydraulics and gravitation it is possible to drop the cylinder to a reasonable depth and the pressure is indicated on a dial attached to the cone. When the cylinder is drawn up, by taking the pressure and the depth and making the proper computations, the total depth of the sea at that point is determined.

The soundings are to be taken from near San Francisco to the Hawaiian Islands.

thence to the Ladrones and from there to the Philippines. The Titus, a 120-ton seagoing tug, is to be used in the work. Soundings will be taken every half hour with the tug going at six miles an hour.

SHADE FOR SCORCHERS.

Now the scorcher will have no excuse for stopping to rest in the shade for he can carry it with him all the time. A



Rochester man has invented a canopy to attach to the steering post of a bicycle. The canopy is pointed in front to cut the air and view holes are provided on each side.

ROCK AND KEEP COOL.

For people who are too old to travel under the bicycle canopy, L. M. Sartrain of Tracy City, Tenn., has invented a summer breeze attachment to the ordinary rocking chair.

An air pump is fastened to the back of the chair and is worked by rocking back and forth. The air is discharged through a pipe which can be adjusted in any direction desired.

TO DELIVER TRAIN ORDERS.

B. E. Andress, Port Alleghany, Pa., is the inventor of an instrument by which train orders may be delivered to conductor

or engineer while their train is in motion. It consists of a rod at the end of which is a hoop to be grasped by the hand or caught by thrusting the arm through. The orders are placed in an envelope, which is held by a snap.

TELEPHONE OVER THE ALPS FOR THE FIRST TIME.

Greetings by telephone over the Alps were sent for the first time last month. The Italian minister of telegraphs, speaking at Turin, wished President Loubet a Happy New Year, talking over a distance of 500 miles. The connection extends to the towns of Northern Italy, Turin, Milan and Bergamo. Next year the telephone is expected to be in service between Paris, Florence, Ancona and Rome. In two or three years it is expected that an extension will be made to Naples and Southern Italy.

DEFECTS IN TORPEDO BOATS.

Defects have been discovered in the 16 torpedo boat destroyers and 12 torpedo boats recently built and still under construction which it is thought will necessitate a thorough overhauling of the entire 28 boats. The chief trouble lies in over displacement, which will necessitate a considerable curtailment in the weights of the ordnance, engineering and equipment departments. Some of the vessels are said to be 40 tons over the required displacement. As speed is the important requirement in a torpedo boat, overweight is necessarily a serious defect.

A Nebraska editor stated that a certain girl's breast was filled with rage, and that wise guy, the printer, got it "rags," and now the editor is camping out on a rise northwest of the town where he can get a good view of the landscape from four different directions.—Exchange.

TAKE PHOTOGRAPHS BY MOONLIGHT.

J. F. Kates, the secretary of the Y. M. C. A. at Winona, Minn., is an enthusiastic photographer and the most recent of his interesting experiments is a very successful photograph taken at midnight by the light of the moon. We reproduce one of these pictures herewith. The original photograph from which we made the engraving could not easily be distinguished from any excellent day-time picture.

ENGRAVED FROM PHOTOGRAPH TAKEN BY MOONLIGHT

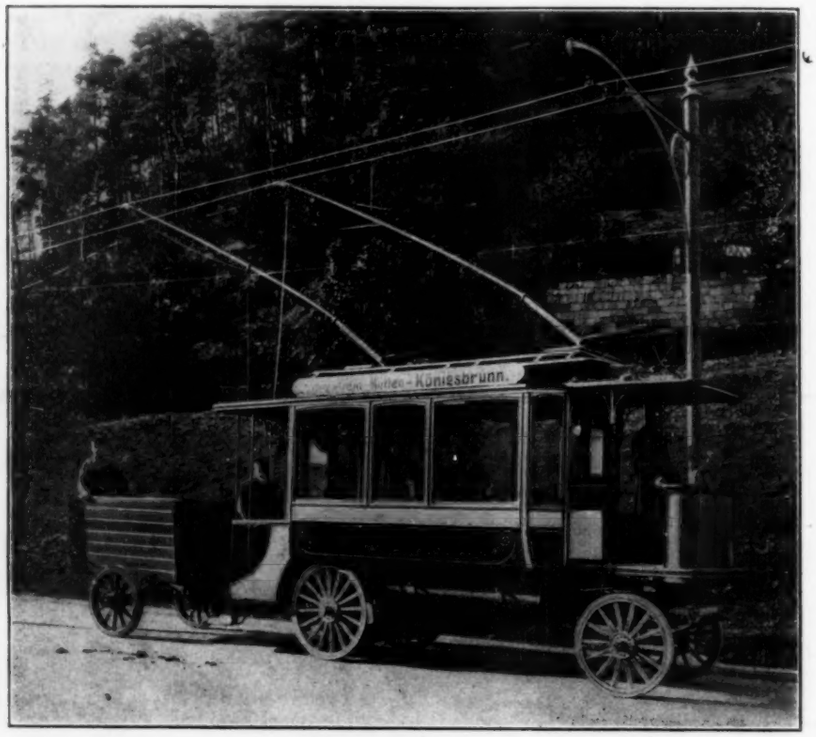
Mr. Kates writes us as follows:

"It was taken on the night of Friday, January 31, from the tower of the association building, with an exposure of an hour and thirty minutes. The time was at about the full of the moon, but the night was cloudy, so that the moon could merely be located. On Wednesday night preceding a view was taken in which two hours and thirty minutes exposure was made upon a slow ordinary plate. The halation from the arc lamp at the entrance of the building was bad, and the hills in the background were lost. For the above view a non-halation plate was used giving better results in less time under less favorable conditions. The lights in the library, the dashes of light on the trolley wire made by the passing cars, the rope of light made by the electric head lights of the cars, the nest of guy wires and distant twigs of trees will be noticed with interest. The heavy coat of snow on the ground aided much in reflecting the light of the sky.

Automobiles across the Caucasus for carrying Russian mails are to supplant the present transport post-horses.

A TRACKLESS TROLLEY CAR.

In the Biela Valley, Germany, may be seen in daily operation a most interesting and unique trolley car. The vehicle itself is more like an omnibus than a street car, and operates by an electric motor con-



TRACKLESS TROLLEY CAR.

trolled by a motorman on the front platform, who also steers the craft. Electric current is taken from two overhead wires, one of which carries the return current, which would ordinarily pass through the rails of the track.

Our illustration and data is taken from the Street Railway Journal of March 1, which gives a complete description. The line was built at a cost of about $5,000 per mile, and the perfect condition of the highways enable the car to run at eight miles an hour. The car carries 18 seated passengers and 6 on the platform; it is lighted by electricity and at night an electric headlight is carried in front.

The car takes no more power on making a curve than on straight road, in this respect having an advantage of cars which run on rails; but twice the power is required to move the car that would be necessary on a tail track. This loss, however, is offset by the saving in interest which would be paid for the cost of laying tracks, and of course there are no tracks to keep in repair.

A small trailer wagon is hauled when there are trunks or packages to carry.

Germany is the best educated nation in Europe.

COST OF LIVING INCREASED FORTY PER CENT.

The cost of living has increased 40 per cent in the United States since July 1, 1897. The fairest way to determine the cost of living from the range of prices for such commodities as are the essentials of individual and family consumption is to find the figure representing the money value of the average per capita consumption, expressed in values. The figures in the following table deal with the unit of the average per capita consumption, expressed in values:

	Bread-stuffs.	Meat.	Dairy and garden.	Other food.
Jan. 1, 1898	$13.51	$7.34	$12.37	$8.31
Jan. 1, 1899	13.82	7.52	11.46	9.07
Jan. 1, 1900	13.25	7.25	13.70	9.20
Jan. 1, 1901	14.49	8.41	15.56	9.50
Jan. 1, 1902	20.00	9.67	15.25	8.95
	Clothing.	Metals.	Misc'l.	Total.
Jan. 1, 1898	14.65	11.57	12.11	70.94
Jan. 1, 1899	14.15	11.84	12.54	89.42
Jan. 1, 1900	17.48	18.09	16.31	95.30
Jan. 1, 190[illegible]	16.02	15.81	15.88	95.69
Jan. 1, 1902	15.55	15.38	16.79	101.69

Flying is not a 20th century idea. In 1273 Friar Bacon predicted that flying would "shortly" become a general practice. Bishop Wilkins in 1652 said: "It will yet be as usual to hear a man call for his wings when he is going on a journey as it is now to hear him call for his boots."

Emperor William of Germany carries a life insurance of $5,000,000. King Edward VII. is insured for $3,000,000, and the Czar of Russia for $8,700,000.

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TO IMPROVE RAILROAD TERMS.

Familiar vernacular of rails is to be abolished on the Northwestern railroad after April 1, and even a greater degree of politeness, good English and general civility among employes will be required than ever before. "Whistle signals" must hereafter be called "audible signals"; running of trains is to be known as the "movement of trains"; trains will not "break apart," but "part" or "separate"; "engineers" will be known as "enginemen"; "sidetracks" are to be called "auxiliaries"; instead of saying "we're sidetracked," it will now be "this train is on an auxiliary waiting for a train or superior right to pass"; "the hind end brakeman," will be "the man in charge of the rear end of the train."

FEAR LONDONERS WILL BECOME BLACK.

German scientists have caused considerable stir in England by predicting that Londoners are to become black because of the influence of smoke and soot. One of these scientists says:

"A mud-laden river flows through the filth-coked city under a smoke-clogged sky. The air that the Londoners breathe is tinted with soot. The complexion of the average Londoner is becoming more and more sallow, and in the not distant future London men and women will be black through absorption of dirt and soot pigments.

Prof. William Allen Pusey of Chicago says that the Londoners are in no danger. He said "What has made people black or brown or yellow? It has been nature's effort in protecting them from tropic and semi-tropic suns. All men were white in the beginning and were darkened to a greater or less degree by being tanned from exposure to the sun.

Prof. Birkeland, of Sweden, is constructing a cannon with electric magnetism as the motive power, instead of explosives. A small model of the invention throws projectiles weighing a pound with great force.

In the United States the number of miles of railway in proportion to the number of inhabitants is nearly double that of any any other country of the world.

APRIL 1902

THE FOUR-TRACK NEWS

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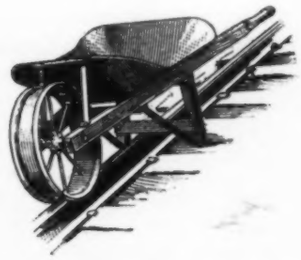

barrow has been made which has a grooved wheel, which rides on the rail and can be moved with the least possible effort.

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E. B. Clifton of Withee, Kas., has invented a stretcher for use in accidents, provided with adjustable legs which can

be let down and thus form a cot. It often occurs that the transfer of the patient from a stretcher to a cot is attended with great pain and sometimes danger to the patient. This is intended to obviate both.

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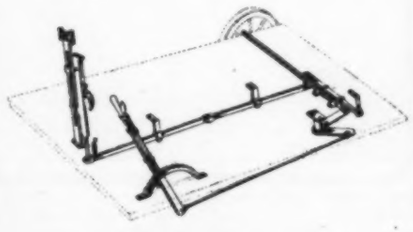

his iron weight at home. The illustration shows the operation which locks the wheels by the movement of a lever.

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WANTED—8-foot Robinson or Keene cornice brake. Geo. E. Roesch, Aurora, Ill.

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WANTED—Six second-hand round reels, one horizontal bran duster, one centrifugal reel. All suitable for 50-barrel mill. J. M. Mattingly, Hartford, Ky.

WANTED—Second-hand bran duster and 50 or 60 horse-power steam feed pump. Sam Howard, Howardstown, Ky.

FOR SALE—9 greenhouses, well stocked, 2 sectional steam boilers, potting sheds, etc., all nearly new; dwelling house, barn, out buildings, 8 acres land, endless water supply, 1 hour from New York City; $8,000. Christie, Florist, Somerville, New Jersey.

HELP WANTED.

WANTED—Young man to assist in greenhouses. State wages. M. Ullenbruch, Port Huron, Mich.

WANTED—Tailor (ladies'); first-class man. Address Pettis Dry Goods Company, Indianapolis, Ind.

WANTED—Cabinet makers to work on store fixtures. A. Gutmann & Co., 149 E. Chicago av., Chicago, Ill.

WANTED—A first-class electrotype molder or finisher; wages $18 for 54 hours. Crane & Co., Topeka, Kas.

AUSTRALIA—Band saw filer and sawyer for Australia. Expense of trip paid. Time to begin on arrival at destination. State wages expected for one year's engagement. Board and lodging furnished. Refer to last employer. Address Allis-Chalmers Company, Milwaukee, Wis.

PRINTER—To revive paper in R. R. town on shares; material furnished; owner suddenly blinded; will trade at half cost. Address "Commercial," Crothersville, Ind.

MACHINE HANDS—Wood; first-class, steady work, good wages, stock cutter preferred. Original Mfg. Co., Evanston, Ill.

MEXICO—Experience man wants position in the implement business in Mexico. Speak Spanish and am well acquainted with the trade. Address T. E. Bramel, Lewiston, Idaho.

Attractions for Next Week.

This is a day of hurry and brevity. The American people have not got the time to pore over long, complicated, obtuse articles to get the meat out of them. To keep up the pace they have got to get their knowledge by the quickest and easiest way possible. That is the reason Popular Mechanics is published. It gets the meat out for you.

Is there light at the bottom of the sea? The brilliant coloring of fishes found at enormous depths tend to prove that there is. Next week's Popular Mechanics will contain an article about it.

Few people realize the great danger of hand-shaking. Often deadly, contagious disease is thus spread promiscuously. We will have an interesting story about it next week.—Did you know that your body is a veritable hot-house, in which various kinds of flowers are continually growing? Such is actually the fact.—The coming battle will be a conflict in the clouds; air ships will blow up whole cities by dropping explosives on them from high above, and then there will be awful wars between opposing fleets of air ships; such are the predictions of Dr. H. G. Wells as told in the next issue.—Would you like to know about the greatest house-cleaning on record? It happened a few days ago. It was the first time the place had been cleaned in 400 years. In that one house-cleaning ten tons of dirt were removed every day for eight months; 2,200 scrubbing brushes were used every week and 5,000 pounds of soap.—Out in California they are using the sun's heat as a source of power; the sun's rays produced enough steam to pump 1,400 gallons of water per minute.—Did you know that great brick and stone walls may be shaken and loosened by the playing of a violin?—A toy bird that can actually fly has been invented.—Now they are making car wheels out of old United States currency.—Cows were milked in a Connecticut town to quench a fire.—There is a floating button factory on the Mississippi river which, instead of having the mussel shells brought to it, floats about in the water until it comes to a bed of mussel shells and then goes to work manufacturing buttons.—We haven't the space to mention half the interesting things in next week's issue of Popular Mechanics. It is getting so that nearly everybody likes to read it.

POSITIONS WANTED.

HARNESSMAKER—Good, single preferred, for all-around work; at once. H. Becker & Son, Polo, Ill.

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PLUMBER, first-class, wishes work in city or country; wages moderate. W. Kelly, 307 East Sixtieth street, New York.

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UNDERTAKER—Young single man of five years' experience in the furniture and undertaking business. Will furnish any state license. Address Fred L. Griswold, Delton, Mich.